

A simple quick test for detecting resistance to glyphosate in perennial ryegrass (*Lolium perenne*)

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Summary To assist with detecting glyphosate-resistant perennial ryegrass (*Lolium perenne* L.), a quick test was developed to use tillers taken directly from suspected plants in the field. To develop the technique, plants of known glyphosate-resistant (J) and susceptible (SP) populations were established in a glasshouse. When plants had 10 to 15 tillers, they were split into plantlets composed of three tillers each with some root material. Plantlets were trimmed so that only rapidly expanding leaves remained. Trimmed plantlets were weighed before submerging their lower portions in 20 mL of glyphosate at concentrations of 0, 10, 40, and 160 mg a.e. L⁻¹ within 25 mL plastic vials, which were then placed in a growth cabinet. After eight days, plantlets were weighed again and leaf

injury was scored based on severity of injury. The level of herbicide injury to plantlets significantly increased as glyphosate concentrations increased in both Populations J and SP. However, at glyphosate rates of 10 and 40 mg L⁻¹ the level of injury was negligible for Population J, both for scores of injury and reductions in plant fresh weight, whereas plants from Population SP had significant differences in injury score and fresh weight reduction. This test should be a useful quick test for the detection of resistance in ryegrass as it does not need sophisticated equipment, does not require the plant to set seed before testing can be conducted and is faster than the Syngenta Quick Test as it can provide results within eight days of obtaining plants from the field.